David Dodge: Improving Canada’s productivity

Remarks by Mr David Dodge, Governor of the Bank of Canada, to the Canadian Council for Public Private Partnerships, Toronto, 28 November 2005.

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Investing in productivity

Today I want to discuss the importance of efficiency in Canada's economy. Specifically, I'll focus on some of the elements that contribute to productivity growth in Canada—a subject that I've addressed before and that you've been hearing a lot about lately.

Let me start by explaining what we mean when we talk about productivity. Measures of productivity tell us how much output we produce from the use of tangible inputs—such as skilled workers and capital equipment—and intangible inputs—such as technological advances and managerial and entrepreneurial know-how. Productivity rises over time as we boost output by finding new and more efficient ways to use these inputs.

When measuring productivity, economists often prefer to use a measure called *total factor productivity*, which includes all these inputs—capital, labour, innovation, and know-how. In practice, however, it is very difficult to measure total factor productivity. That's why analysts usually focus on the more commonly used and better-understood measure, labour productivity. This measure tells us how much output is produced per worker or per hour worked. Labour productivity has the added advantage of being closer to measures of standards of living and more directly comparable across countries. Of course, labour productivity is affected by experience and education, by the amount of capital equipment (notably machinery and equipment) that is available to workers, and by innovation and know-how.

We care about productivity because it is critical to our national standard of living. There are other factors that affect our living standards—changes in our terms of trade and in employment-to-population ratios, for instance—but productivity growth is the main contributor to *sustained* improvements in real incomes and rising standards of living over the long term. But productivity growth in Canada, measured as real gross domestic product per hour worked, has averaged less than 1 per cent per year so far in this century. Frankly, we must do better.

The components of productivity

But what does "doing better" actually mean? First, it means increasing the amount and the quality of physical capital per worker—giving employees better tools to work with. It also means allocating resources more efficiently and being more innovative. In my remarks today, I'm going to focus on the two latter elements—efficient allocation and innovation.

I'll start with efficient allocation. At any point in time, we allocate resources among competing uses, always trying to use the resources we have as efficiently as possible. The goal is to move to the point where, given current production practices and knowledge, we are getting the absolute most out of the labour and capital resources at our disposal.

The second element of productivity is innovation. This means generating new knowledge, improving technology, and enhancing both the processes and the organization of production. To take advantage of innovation, we also need to upgrade the skills of our labour force and, in some cases, change our business and managerial practices. Innovation and skills enhancement, when combined, lead to continuing growth of output per unit of input.

For long-term improvements in productivity, we need both innovation and more efficient allocation. And so enterprises, sectors, and governments must follow the practices and policies that not only will allocate resources more efficiently, but also provide the framework to encourage innovation.

Productivity through innovation

When we talk about encouraging innovation, we're talking about two things. First, there are the incentives to encourage *product* innovations. These include the encouragement of research and development (R&D) that generate the "eureka!" kind of knowledge creation that's done at universities, research institutes, and knowledge-intensive companies. But just as important, although sometimes overlooked, are the research and development that lead to incremental improvements in the design and performance of existing products.

This kind of innovation requires investment. In Canada, we make quite large public investments in research through our public institutions. Research spending by Canadian companies and private sector institutions, on the other hand, tends to lag that of other countries.

But dollar amounts don't tell the whole story. Research success depends not only on the amount that you invest, but also on how efficiently you invest it. That's why it is hard to judge the innovative capacity of an economy or an enterprise by the raw dollars that it spends on R&D. The fact that the R&D budget of Apple Computer has lagged behind the computer industry average would come as a surprise to anyone who has a new iPod on his or her Christmas list. Others are probably in a better position than me to offer advice on ways to get more bang for your research buck, but this will be an important part of future discussions on productivity.

The second type of incentive to encourage innovation relates to improving the *processes* used by an organization. For example, how can an organization use new technology to restructure its business and managerial practices? And what incentives drive that restructuring? Well, the most obvious incentives are the need to maintain a competitive edge, the desire for profit, and the fear of going bankrupt. That is why economies that have intense competition in domestic markets—from both domestic and foreign firms—are the most innovative. Indeed, competition encourages both product and process innovation.

But innovation means taking risks. Enterprises must also be given the incentives to take those risks. And they should be rewarded by the market when they do so. Among other things, this requires a financial system that appropriately prices the risks and potential returns being taken on by investors.

Finally, we know that innovation is not a government-driven process: It occurs on the shop floor, in the start-up's laboratory, and in the minds of entrepreneurs. In our businesses and public sector institutions, we need to develop a culture that encourages both the "eureka!" moments and the incremental improvements that come from the incentive to stay just one step ahead of the competition.

Productivity through efficient allocation

Let me now talk about improving productivity through more efficient allocation of resources. Some of the policies that promote better resource allocation are the same ones that encourage innovation. Let me mention four elements that are critical.

First, we need an appropriate legal framework of property rights, including intellectual property and contract law. This framework must also include suitable penalties for those who break these laws, breach the public trust, or commit fraud.

Second, labour markets must operate efficiently, encouraging the flow of resources from less-productive to more-productive uses, and from shrinking sectors to growing ones. This flexibility is encouraged through appropriate labour market policies, education, and training. I won't say more about this—recent research by the International Monetary Fund and the Organisation for Economic Co-operation and Development explores this issue thoroughly.

The third critical element is a financial system that operates efficiently, helping to allocate scarce economic resources to the most productive uses, in the most effective way. In previous speeches, I spoke about the importance of a well-functioning financial system and about the need to support the efficiency of our financial institutions. I also spoke about the need to promote efficiency in the regulation of securities markets and about the role that Canada's pension system can play.

Building the right infrastructure

The fourth key element is the construction and operation of the physical infrastructure that we need for economic growth and development. I will focus the remainder of my remarks on this area. This critical infrastructure includes public assets, such as highways, public transit and transportation facilities, power, waterworks and waste water, schools, hospitals, and other facilities. It also includes private infrastructure, such as pipelines, rail, and telecommunications networks.

To illustrate why infrastructure is an important means of encouraging more efficient resource allocation, let me offer a few examples. Canada is envied around the world for its wealth of natural resources. But getting these natural resources to market has always relied on railways, pipelines, ports, and other transportation infrastructure. Similarly, Canada's world-renowned telecommunications sector has grown out of huge investments in this country's land-based and satellite infrastructure.

The clusters of industrial, manufacturing, and technology companies located in our major centres are there because our cities function well, with quality water, sewer, transportation, and municipal and social services. These companies employ Canadians who were educated and trained by our public schools, colleges, and universities. And these companies are funded by individuals who are willing to invest their savings through a financial system that they trust.

Clearly, infrastructure plays a key role in creating an efficient, productive economy. But today, there are clear signs of a public infrastructure deficit in Canada. And there is a growing concern that this deficit could harm Canada's productivity growth and standard of living, unless we take steps to correct it.

Estimates of the magnitude of this deficit vary considerably.[1] But it is generally acknowledged that the gap will not be reduced solely through government financing. No single means of development always creates the right infrastructure, so it will take a number of different solutions. Through our history, we have used various methods.

We have seen private infrastructure development, encouraged by governments through land grants, monopoly rights, subsidies, and so on. In these examples, the private sector takes on the risk of financing the infrastructure, with the promise of profits down the road. Perhaps the most well known example of this type of infrastructure development is the Canadian Pacific Railway.

We have also seen purely public infrastructure building, in which the government or its agencies build and operate the infrastructure. An obvious example is Canada's network of highways and roads.

Some infrastructure has been built and operated entirely by private companies, under the umbrella of a legal framework that helps to protect their investment and of a regulatory structure that helps to protect the consumer. Cable television is an example of this type.

Finally, there are public-private partnerships (PPPs). These take different forms. Many employ a mix of public and private funding, with the operation and maintenance of the infrastructure performed by a private enterprise on behalf of the government. The most familiar example of a PPP is the Confederation Bridge between New Brunswick and Prince Edward Island. But there are still relatively few existing PPPs in Canada. Other countries, such as the United Kingdom and Australia, offer many examples of successful PPP infrastructure. Unlike most jurisdictions in Canada, these other countries already have a well-developed legal and regulatory framework for PPP investments.

Each of these methods has advantages, but also problems. In the final analysis, it is all a question of incentives. For example, when infrastructure projects are solely publicly funded, the usual incentives to build and operate efficiently—the incentives to avoid bankruptcy and to make a profit—are not the driving motive behind the investment.

The most efficient and timely allocation of resources for infrastructure occurs when the incentives are right. And that framework of incentives usually includes some expectation of profit. This applies

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[1] This is partly due to varying definitions of infrastructure and the high level of subjectivity involved in assessing "need." The Government of Ontario, for example, estimates that the cost of correcting past underinvestment and of building the public facilities that the province needs to accommodate future growth may exceed $100 billion.

equally to decisions on what to build and to decisions regarding how to operate the infrastructure once it is in place.

The hardest incentive to get right is that of proper pricing. A lack of pricing that appropriately reflects demand and supply conditions may be one reason why there have been relatively few PPP infrastructure projects in Canada. It is particularly important to improve pricing mechanisms for services that are provided through public infrastructure. Governments have often been unwilling to price-to-market infrastructure-based services. As a result, shortages are managed through non-price rationing, such as rolling electricity blackouts, highway congestion, or waiting lists for government documents or services. And occasionally, we get the opposite problem—an over-build of infrastructure that cannot be justified by demand. New technologies, such as transponders on vehicles to monitor road use, and meters that allow peak-hour pricing of electricity, provide new opportunities to gauge demand for these services, and to price them accordingly.

Another key incentive with respect to infrastructure investment is the incentive to manage risk. Private financing of infrastructure through the markets tends to lead to better assessment of the risks of the investment, because financial markets are better able to measure and price risk. This is not to say that we should expect the private sector to shoulder all the inherent risks of major infrastructure investments without any public sharing of those risks. But financing through markets provides a mechanism by which we can better assess the economic merits of an investment.

The infrastructure investment climate

These are some of the complex issues facing us as we try to eliminate Canada's infrastructure deficit. The timing is right to make these investments. During the early 1990s, governments had to deal with large fiscal deficits and they simply did not have the cash to invest in building infrastructure. That is not the case today. Further, over the next couple of decades as our population ages, more Canadians will be saving for their retirement. This added saving will boost an already growing demand for long-term financial assets.

Pension and endowment funds are now allocating an increasing share of their portfolio assets to infrastructure investments, in an attempt to increase returns and better manage risk through portfolio diversification. These funds are increasingly looking for longer-term assets that provide a better match to their liabilities. So far, much of this investment has gone to projects in other countries. This is partly because the domestic markets for PPP in these other countries are more developed than ours.

In Canada, we currently see three conditions that present us with a vital opportunity. We have governments that are committed to investing in infrastructure, a private market with an appetite for longer-term financial assets, and a pent-up need for those investments in Canada. If we get this right, we can enhance Canada's productivity in two ways. First, the improved infrastructure can help to boost the productive capacity of the private sector and help to achieve more efficient resource allocation. Second, better infrastructure is a key component in attracting the companies and the people who spearhead continuous innovation.

Conclusion

The Bank of Canada's mandate is to promote the economic and financial well-being of this country. We know that an efficient and innovative economy is critical if we are to achieve sustainable growth and prosperity for Canadians.

That is why, in past speeches, I have focused on the need to have efficient financial institutions and markets. The right infrastructure is also key to promoting efficiency. And PPP is a practical way to match the demand of savers for long-term assets with the economy's need to build critical infrastructure. It is also a way to promote the efficient operation of that infrastructure. That is why I have chosen to focus on this issue today.

I know that over the course of this conference, we'll hear some innovative ideas on how to achieve these goals. Your deliberations are important. The right infrastructure can support and encourage initiatives to increase productivity. Finding innovative and reliable ways to fund this country's current and future infrastructure requirements is a key element of any effort to improve Canada's productivity and raise living standards for Canadians.